

# NHDES Source Water Protection Strategy

November 27, 2018

1:00 pm to 4:00 pm

Rm 213-214

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Planning, Protection and Assistance

Drinking Water and Groundwater Bureau

(603-271-0688)

Source Protection Strategy Update:

<https://www.des.nh.gov/organization/divisions/water/dwgb/dwspp/swp.htm>

# Today's Agenda

## Agenda

1:00 pm – 1:15 pm	Introductions
1:15 – 2:15 pm	Meeting overview (goals)
	Previous Strategy Work by DES
	Source Protections in Place (current)
15 minute break	Break (with refreshments)
2:30 pm – 3:45 pm	Protection: Gaps and Opportunities (discussion)
3:45 pm – 4:00 pm	Next Steps: Informational needs, meeting schedule, working group formation
4:00 pm	Adjourn

# Source Water Protection

- **Source Water Protection** is **protecting source water** (including **water** from lakes, rivers and underground aquifers) from overuse and contamination
- Drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting our drinking water.

# Today...

- Quick “Look back” at the last strategic effort
- Part I - Goals & Scope of the Strategy Update
- Part II - Source Protections in place (Cliff Notes)
- Part III - Protections, Gaps and Opportunities - Exercise/Discussion
- Part IV - Next Steps (formation of working groups)

# Goal of SWP Strategy Update

- Develop a work plan to be implemented by NHDES Source Protection Program & partners
- Promote and facilitate strategies that:
  - prevent the contamination and
  - preserve the availability

...of New Hampshire's present and future drinking water sources.

# SWP Mission and Scope

- Mission: Promote and facilitate strategies to prevent the contamination and preserve the availability of NH's present and future drinking water sources.
- Sets priorities and major activities for the coming years.

# Updates to Source Protection Strategy

2000

- Stormwater guidance
- Land grant (conservation)
- Watershed rules

2009

- AoT/CSPA regs revisions
- Support Watershed plans
- Buffer Gap Analysis
- GW Commission & Private Wells

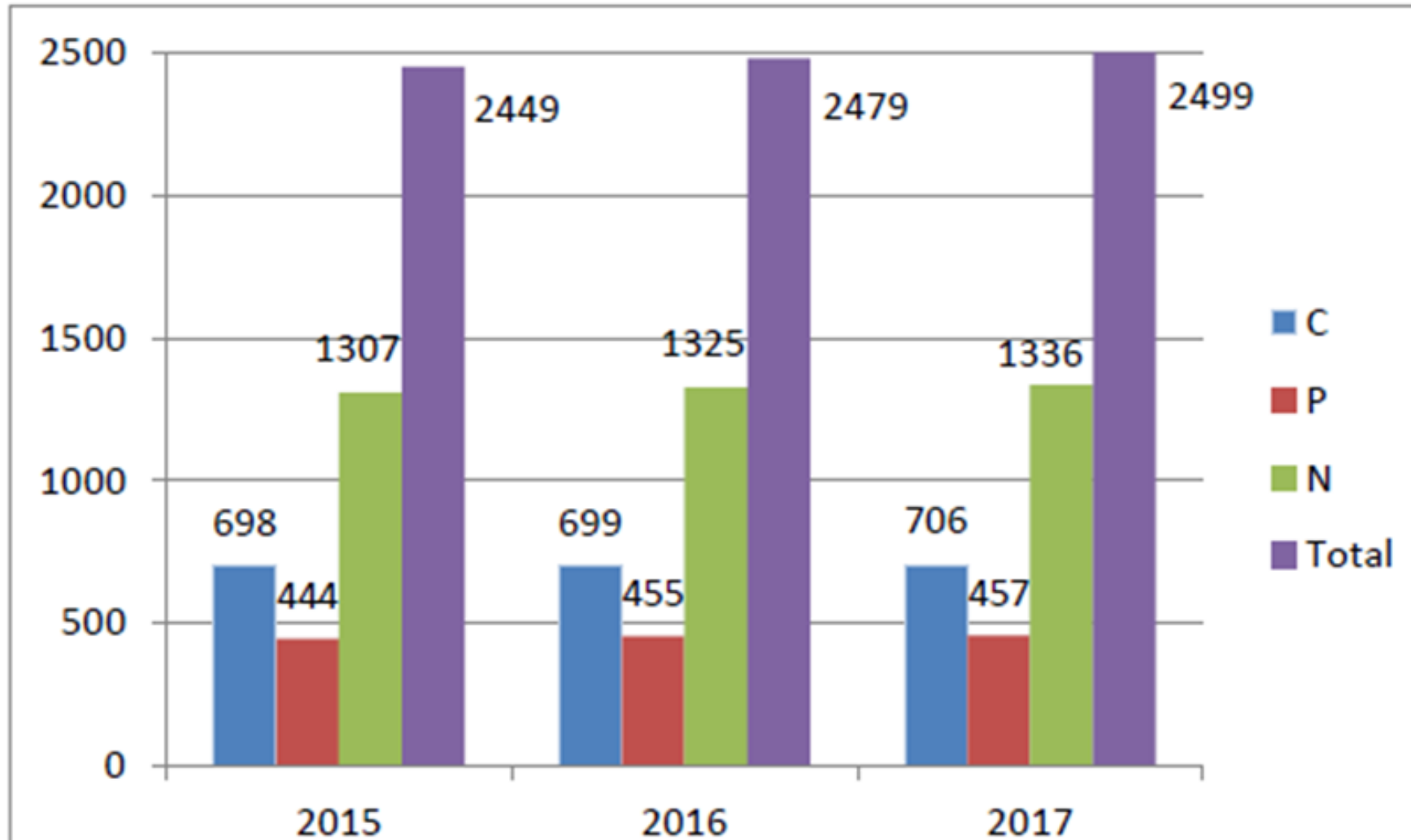
2018



Strategy Update Timeline  
November 2018 – June 2019

# New Hampshire Has Many (~2,500) Public Water Systems

Active Public Water Systems in NH



# Elements of an Effective State Source Water Protection Program

## 1. Measurement

- Assessment, monitoring, tracking level of protection
- Developing a strategic plan

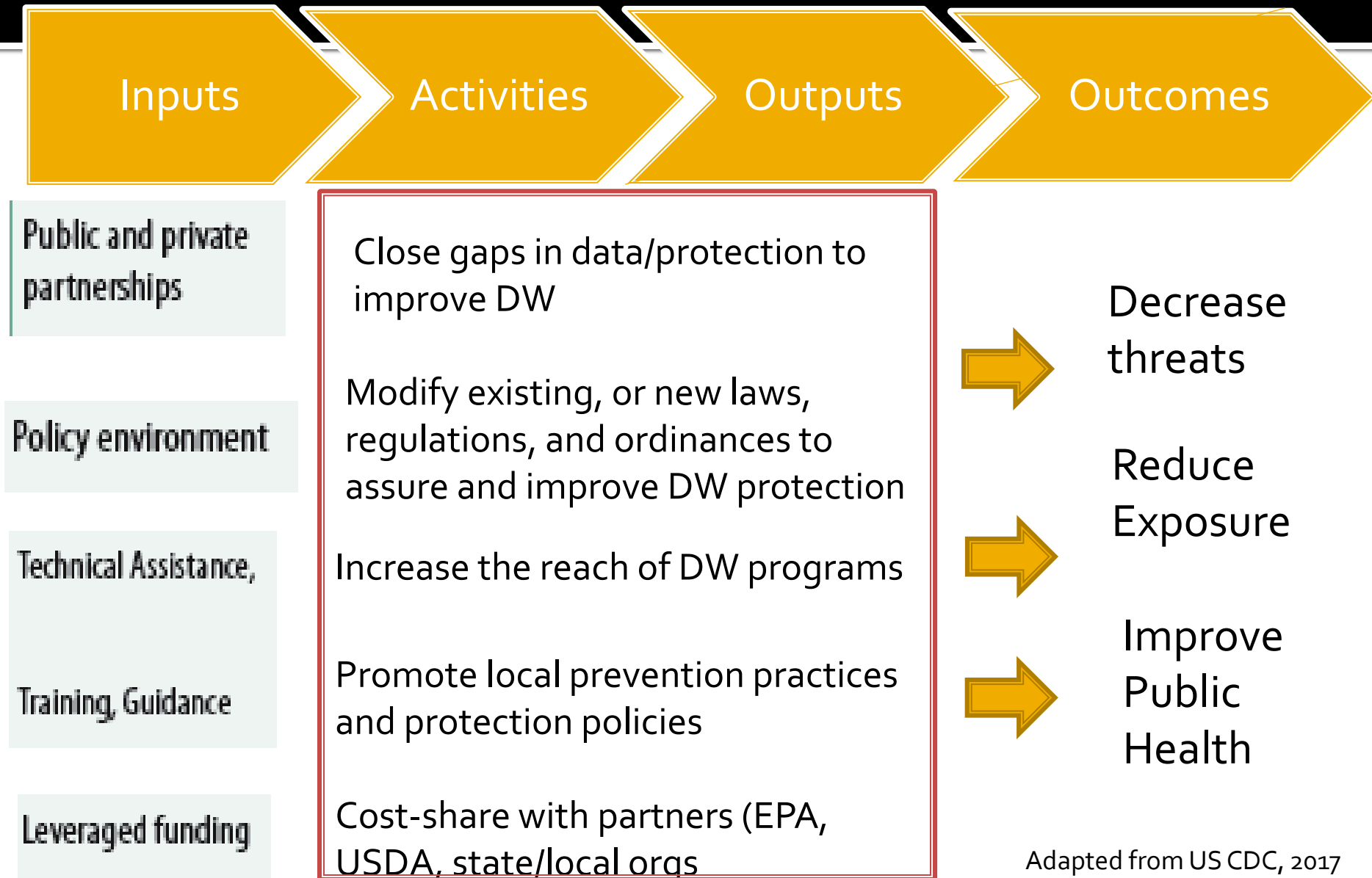
## 2. State Implementation Strategies

- Target geographic areas, types of systems, or threats

## 3. Partnerships, Integration and Leveraging

- Coordination with Clean Water Act programs
- Working with land use decision makers, conservation organizations.

# Source Protection: Inputs, Outcomes



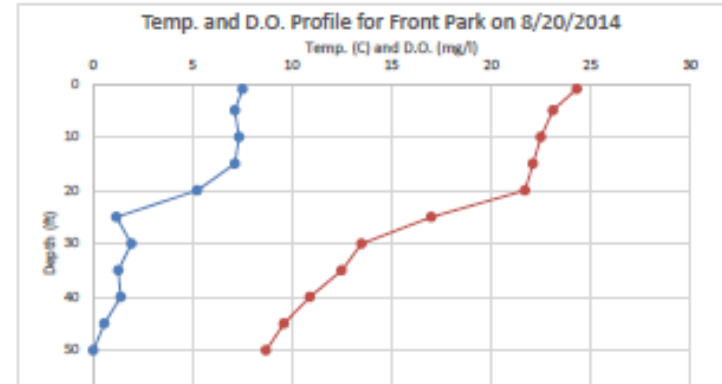
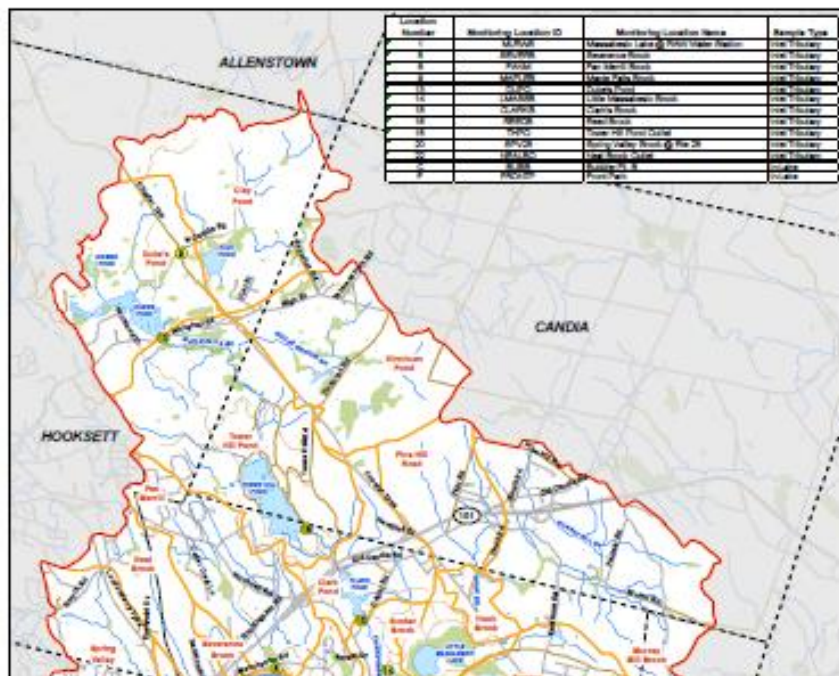
# Previous (2009) Formal Strategy Update: The Cliff Notes Version

- A. Review of SWP Program Activities and Other Program Regulations
- B. Participated in Trust for Public Land led “Land & Water Project”
- C. Addressed groundwater issues per SB 155 Groundwater Commission
- D. Developed a White Paper on Private Well Options (*now being addressed through Arsenic Consortium*)

# Surface Water Protection (2009):

- F. Conducted literature review (effectiveness/ minimum distances to attenuate N and P via riparian buffers)
- G. Reviewed Anti-Degradation as a tool to limit discharge/maintain water quality for source water
- H. Identified candidate surface sources to develop watershed plans (funded updates, new plans)

# MWW Updated Watershed Plan (2015)



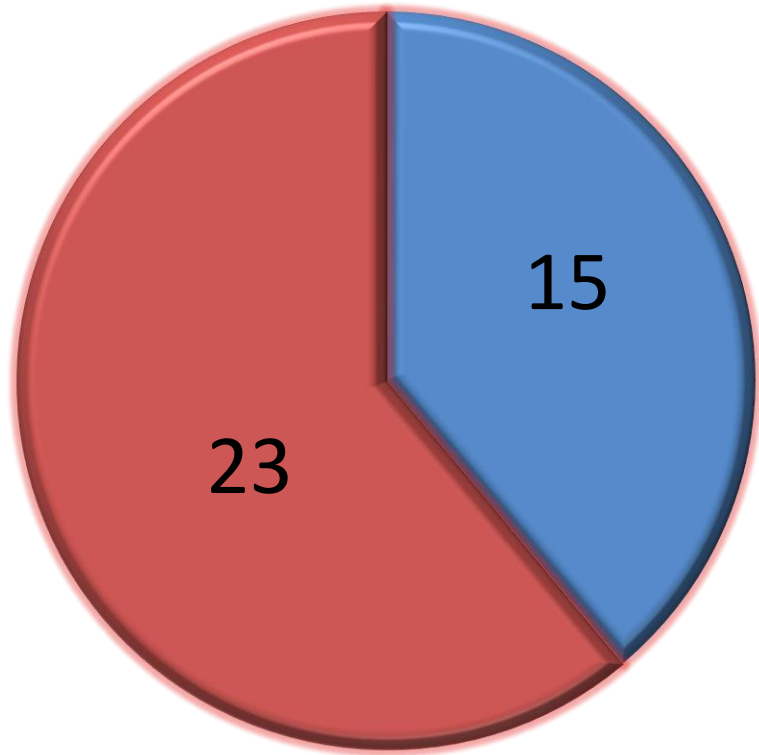
## #1. Revise In-Lake Monitoring Program

MWW has been monitoring Lake Massabesic for a number of years and has an extensive data set showing in-lake temperature, DO, conductivity and salinity profiles. However, there is very limited data on total phosphorus and Chlorophyll-a within the lake, data which is important for assessing the potential for algal blooms within the lake and for managing phosphorus loads from the watershed. Excess phosphorus can result in an overabundance of aquatic plants which in turn can deplete oxygen from the water through the decay process and result in taste and odor problems.



# Public Water Systems w/ Active Watershed Plans & Population Served

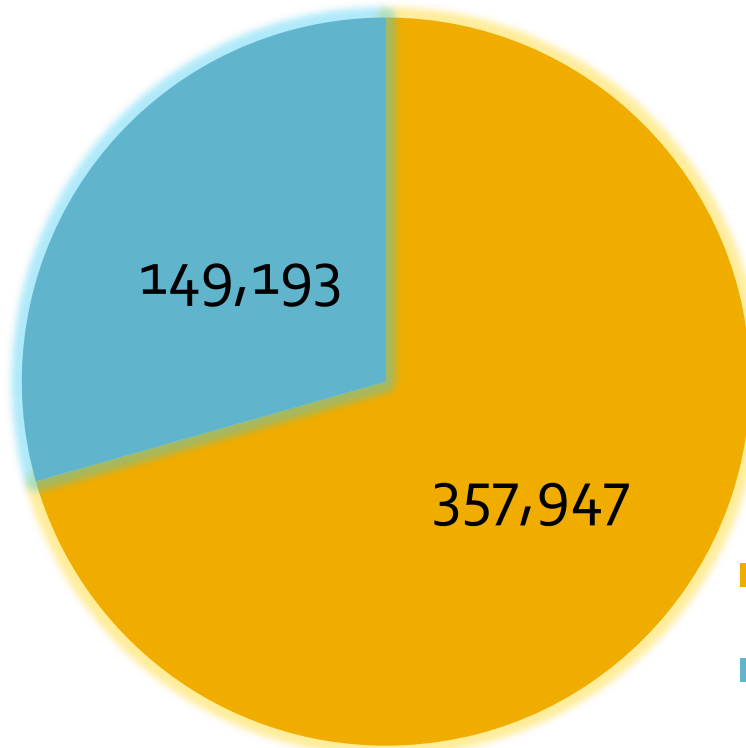
Public Water Systems (#)



■ Watershed Plan - Yes

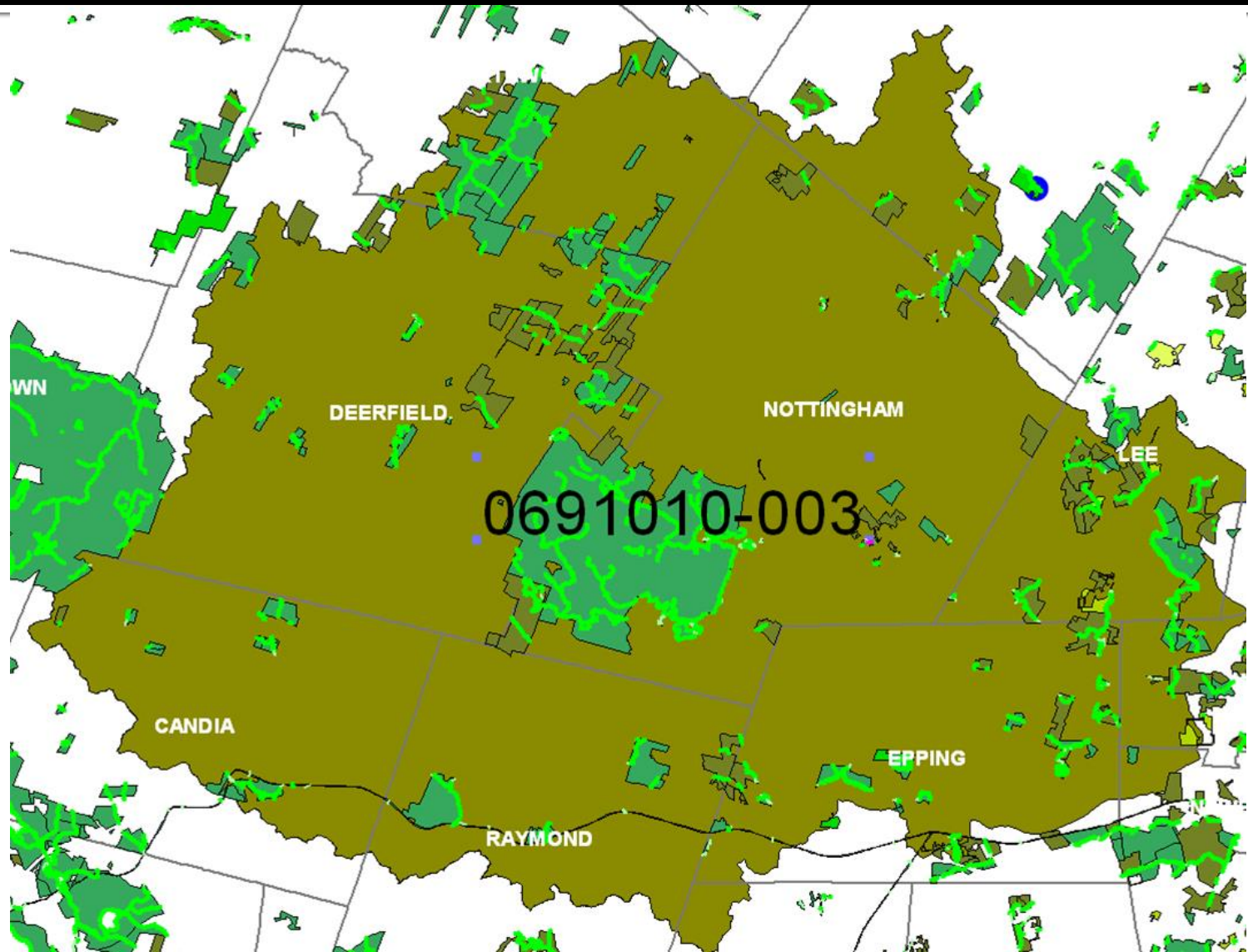
■ Watershed Plan - No

Total Population Served (Plan/No Plan)



■ With an Active Watershed Plan  
■ Without an Active Watershed Plan

# Statewide Buffer Gap Analysis (2009)



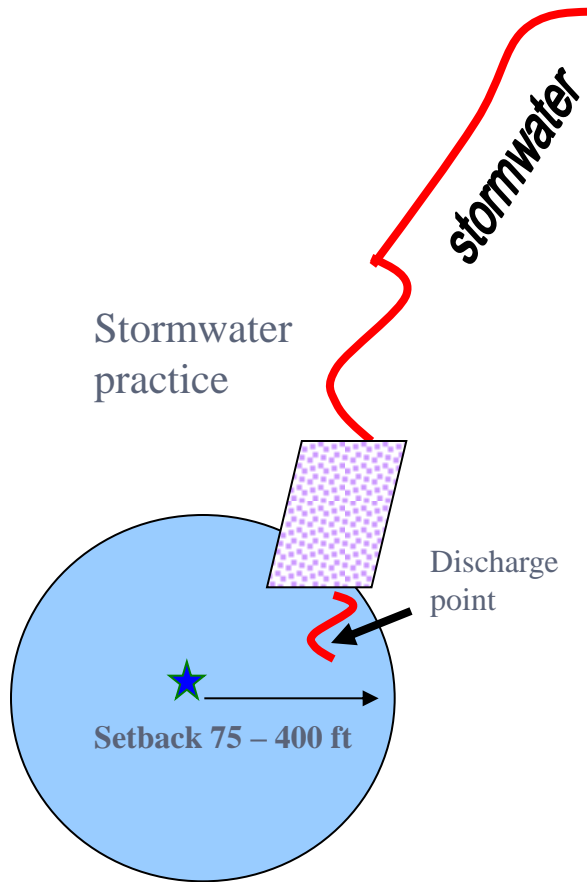
# 2009 Literature Review on Effective Buffer Widths

NON-POINT SOURCE POLLUTANT	AVERAGE BUFFER WIDTH PER POLLUTANT (FEET)	RANGE OF RECOMMENDED BUFFER WIDTHS (FEET)	AVERAGE BUFFER WIDTH (FEET)
Phosphorous	253	Varies depending on slope of buffer. Natural buffer more effective than created grass buffer.	N/A
		Based on multiple studies, a 280-foot minimum buffer width could be expected to remove about 80% sediment inputs. <sup>1</sup>	280
		150-300	225
Nitrogen	156	Based on multiple studies, a 200-foot minimum buffer width could be expected to remove about 80% nitrogen inputs. <sup>1</sup>	200
		100	100
		100	100
		150-300	225

# Alteration of Terrain Regulations Protect Water Wells

## Stormwater Discharge Setbacks

- **STORMWATER DISCHARGE SETBACK.** Stormwater practice must not discharge within a 75' to 400' of certain water supply wells.



**Table 1508-1: Water Supply Well Set-Backs**

<i>Well Type</i>	<i>WHPA Volume (gallons per day)</i>	<i>Setback From Well (feet)</i>
<i>Private Water Supply Well</i>	<i>Any Volume</i>	<i>75</i>
<i>Non-Community Public Water Supply Well</i>	<i>0 to 750</i>	<i>75</i>
	<i>751 to 1,440</i>	<i>100</i>
	<i>1,441 to 4,320</i>	<i>125</i>
	<i>4,321 to 14,400</i>	<i>150</i>
<i>Community Public Water Supply Well</i>	<i>0 to 14,400</i>	<i>150</i>
<i>Non-Community and Community Public Water Supply Well</i>	<i>14,401 to 28,800</i>	<i>175</i>
	<i>28,801 to 57,600</i>	<i>200</i>
	<i>57,601 to 86,400</i>	<i>250</i>
	<i>86,401 to 115,200</i>	<i>300</i>
	<i>115,201 to 144,000</i>	<i>350</i>
	<i>Greater than 144,000</i>	<i>400</i>

# SB 155 Groundwater Commission

- Commission Report
  - Enumerated a number of water “data” needs relating to large water users.
  - Addressed water conservation
  - Municipal authority to limit lawn watering (in drought)
  - Options for Protecting Groundwater Quality to Ensure Availability.

GW Commission: NHDES should continue assessing appropriate land uses near wells, how to improve municipal/local groundwater quality protection assistance, and how future well sites should be protected in state.

# Part II

## SWP Program and Activities

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Refer to Supplemental *Table of Program Activities* or *Setbacks from Drinking Water Supplies*

# Metrics: EPA/States Measure Protection

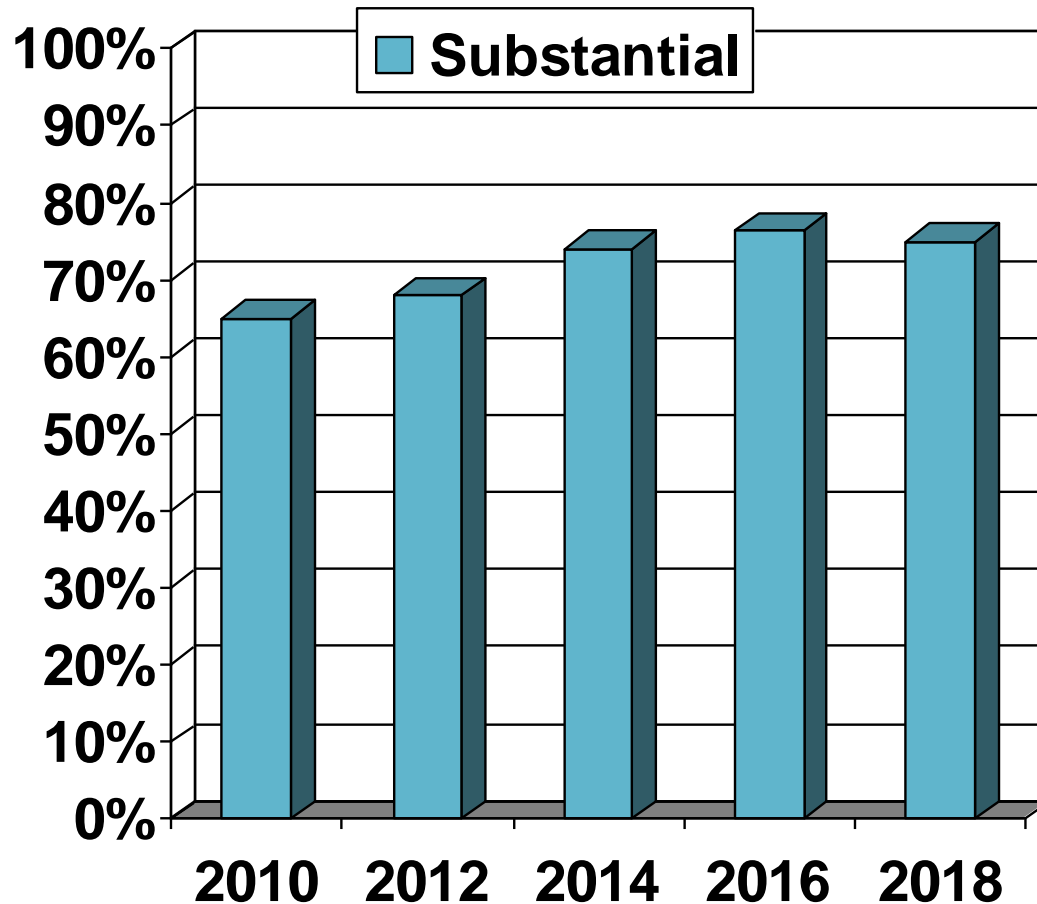
- ✓ Public Education
  - ✓ Local educational programs (Waiver, New Sources)
  - ✓ > 25% of Source Protection Area in Conservation
- ✓ PCS BMP Management
  - ✓ PCS Inventories up-to-date
- ✓ Emergency Plans in place
- ✓ No PWS Significant Deficiencies
- ✓ **Voluntary or Required Programs**
  - ✓ Have a GAA Reclass or Restrictive Zoning
  - ✓ Conduct BMP Inspection program
  - ✓ Have a Filtration waiver
  - ✓ Active Watershed Plan
- ✓ **Land Conservation of WHPA/SWPA**
  - ✓ > 50% for Substantial

“Initial” Protection



Substantial Protection

# Metrics: 75% of CWSs (520 of 685) have Substantial Implementation"



# Metrics: “Substantial” Protection in Two Very Different Watersheds

Canobie Lake



Hanover Reservoirs



“Substantial Protection” with very different watershed conditions.

# Conservation in SWPAs (watersheds)

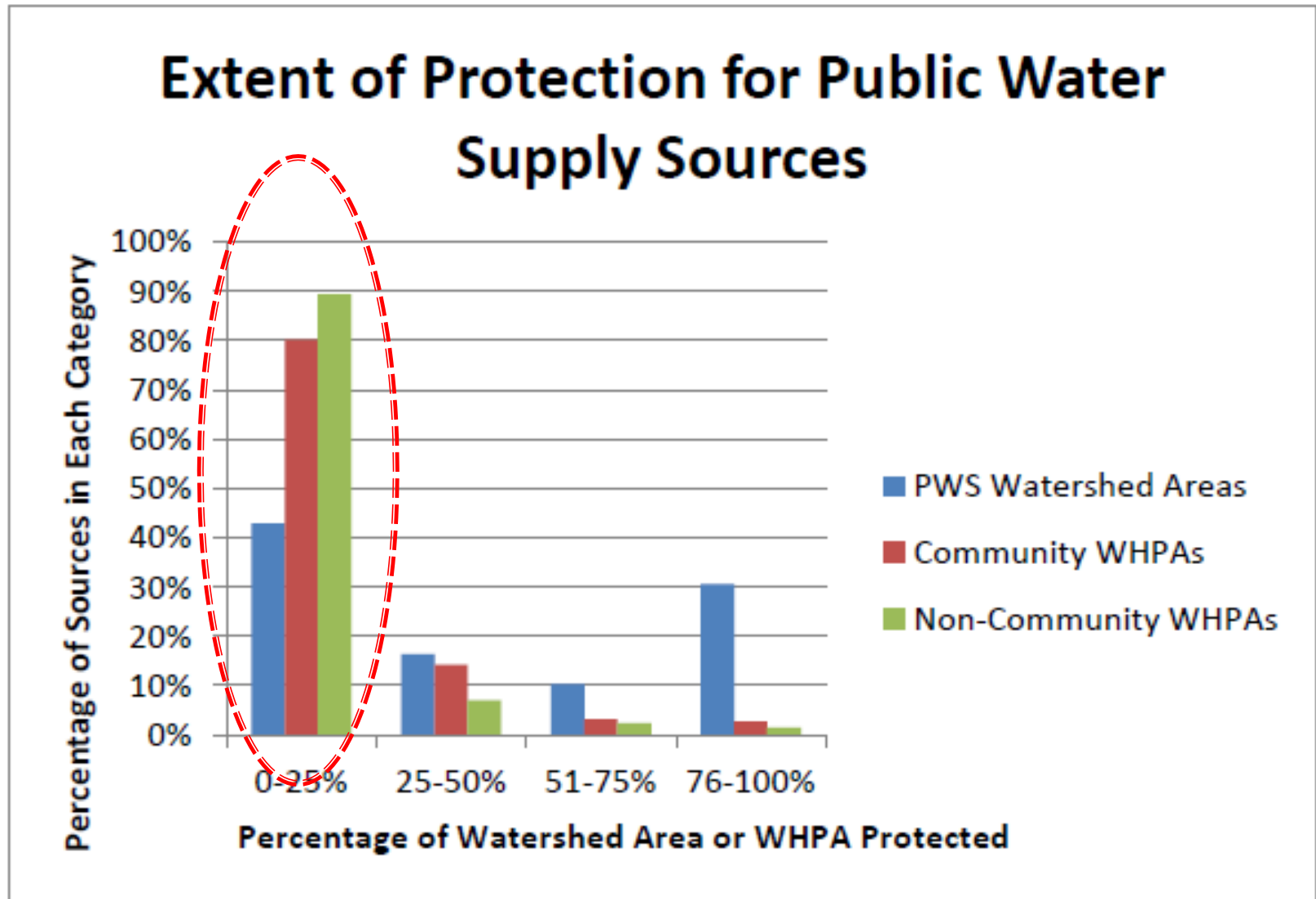
## Appendix B

### Water Supply Watershed Lands with Permanent Protection

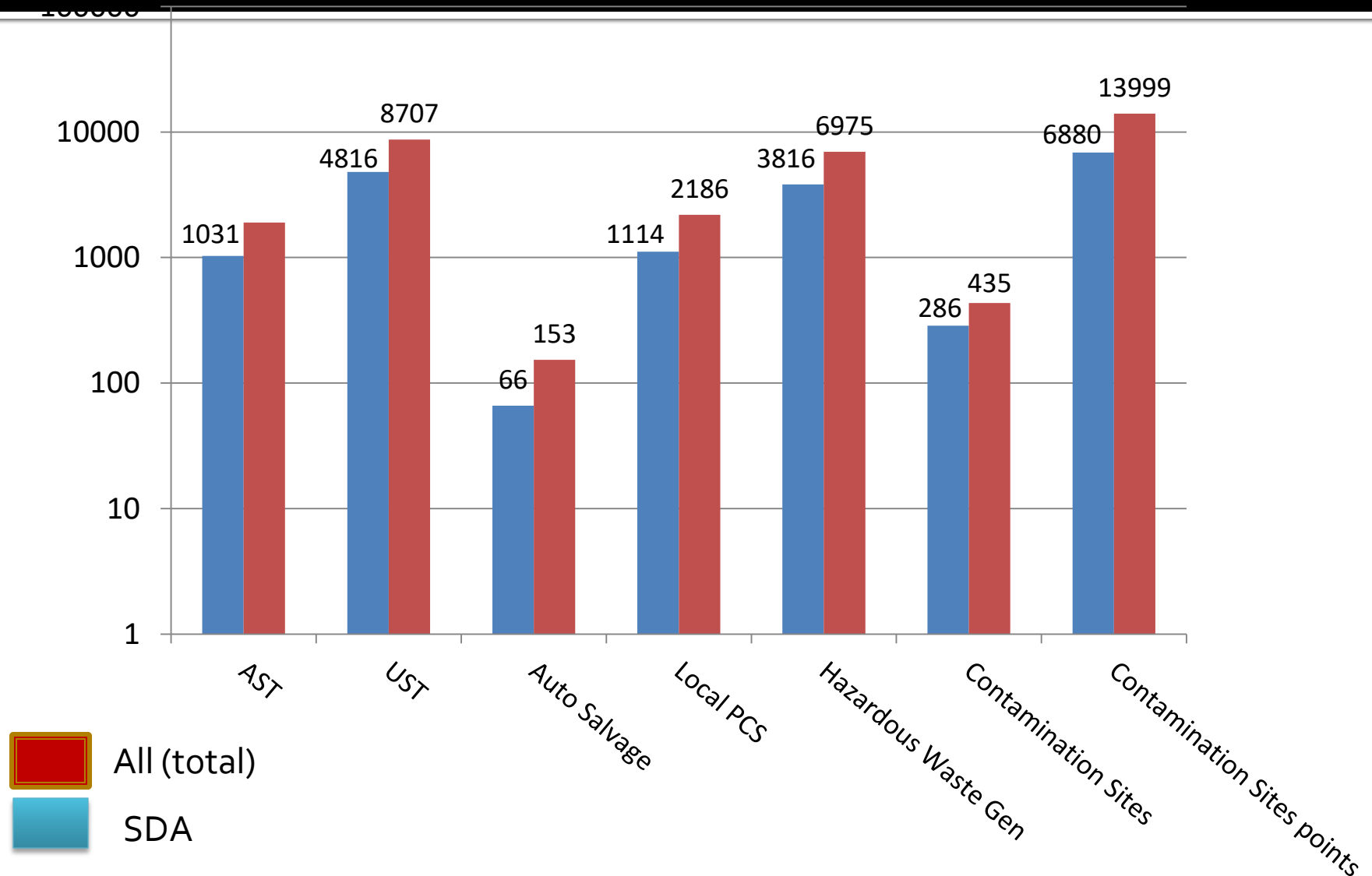
Prepared by NHDES 11/2/2017

PWS Source ID	Public Water System	Pop. Served	Watershed Area (acres)	Acres Permanently Protected	Percent of Watershed Area Protected
0351010-001	CANAAN WATER DEPT	600	1656	0	0
0461010-007	CLAREMONT WATER DEPT	9000	58	0	0
0461010-008	CLAREMONT WATER DEPT	9000	118	0	0
1691010-001	NEW HAMPTON VILLAGE PCT	600	596	0	0
1741010-001	NEWPORT WATER WORKS	5000	919	0	0
1911010-001	PITTSFIELD AQUEDUCT	1595	754	0	0
2051010-001	SALEM WATER DEPT	20000	1860	0	0
1141010-001	HILLSBOROUGH WATER WORKS	2000	1266	3	0

Figure 2 - Percentages of land protected in SWPAs for public water systems in N.H.

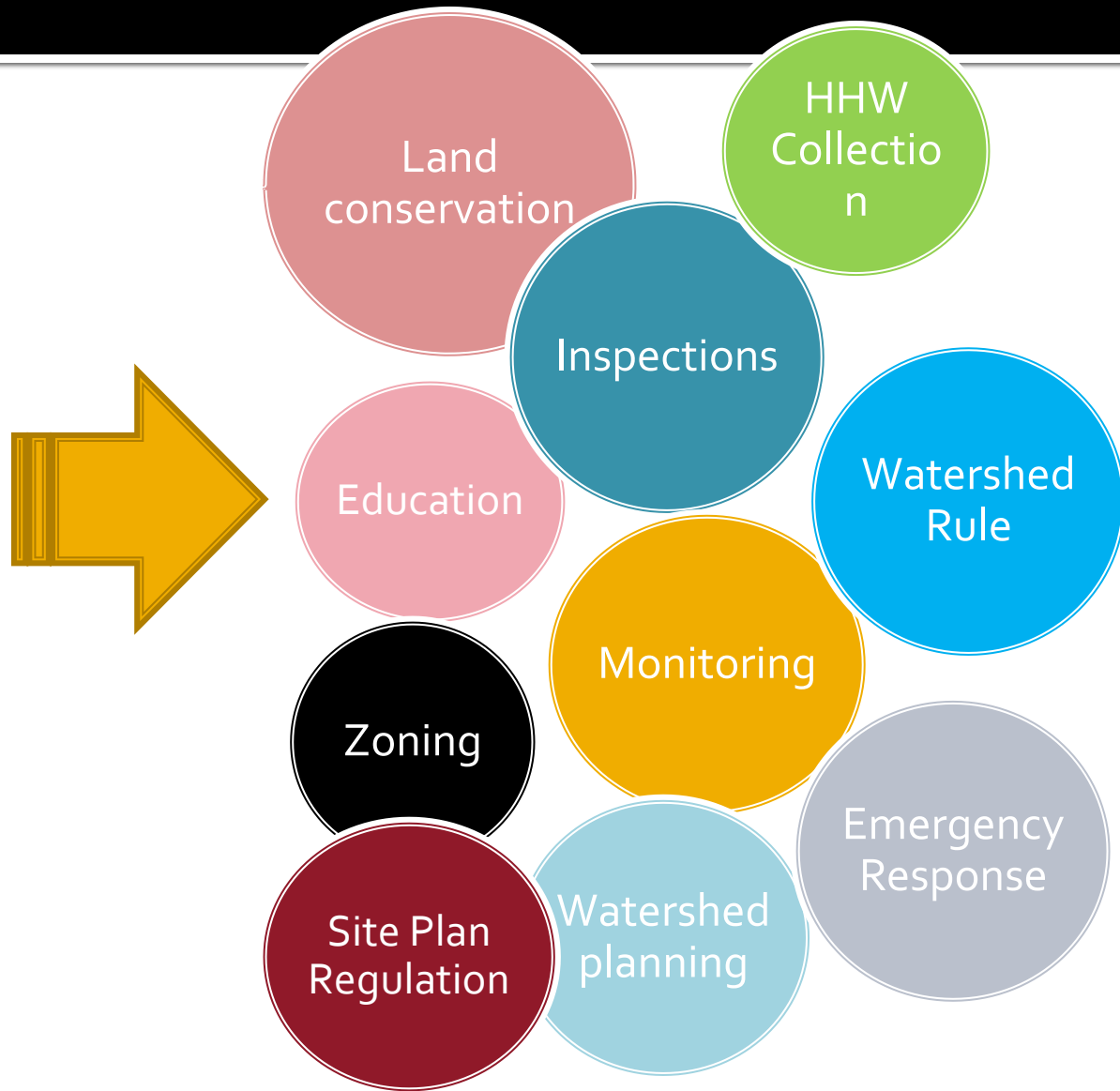


# Number of Higher Risk Activities within Stratified Drift Aquifers and Total



# Vulnerability Metrics: Early 2000s Source Water Assessment Reports

Vulnerability	Intensity / Proximity
Detects	H/M/L
Well/intake integrity	H/M/L
KCSs/PCSs	H/M/L
Highways/RR	H/M/L
Pesticide application	H/M/L
Septic systems	H/M/L
Urban land cover	H/M/L
Agricultural land cover	H/M/L
Animal units	H/M/L
Wastewater treatment	H/M/L



# Metrics:

## Land Use Intensity

"A lower intensity of land development accompanied by increased water company land ownership and greater amounts of preserved land in the source water area *reduces the susceptibility of the drinking water source to potential sources of contamination.*"

CT Drinking Water Assessment and Source Protection Program (online)  
<https://portal.ct.gov>

NHDES Source Water  
Assessment

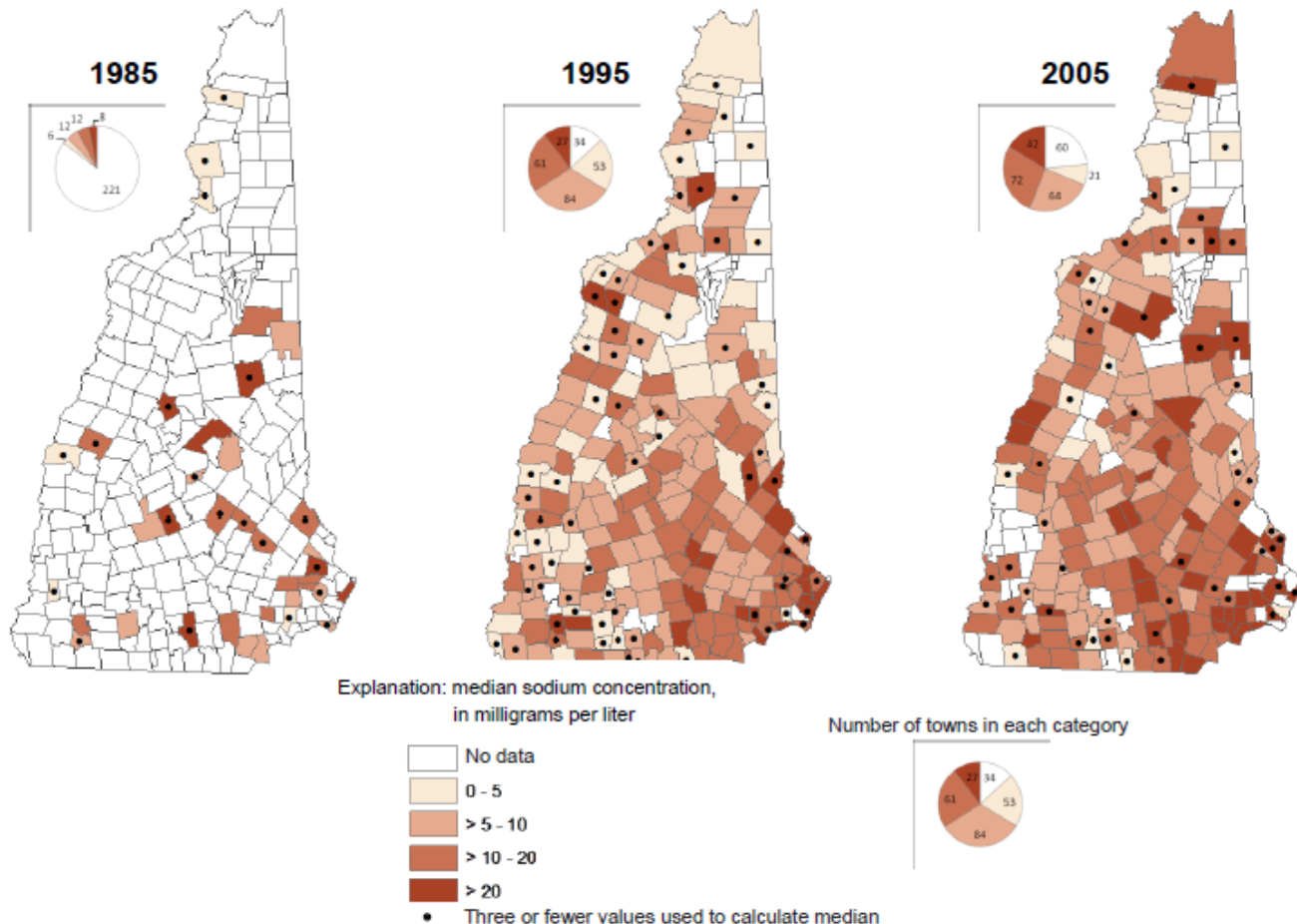
Criteria (ex. low  
vulnerability)

< 10% of WHPA  
has urban land  
cover

and

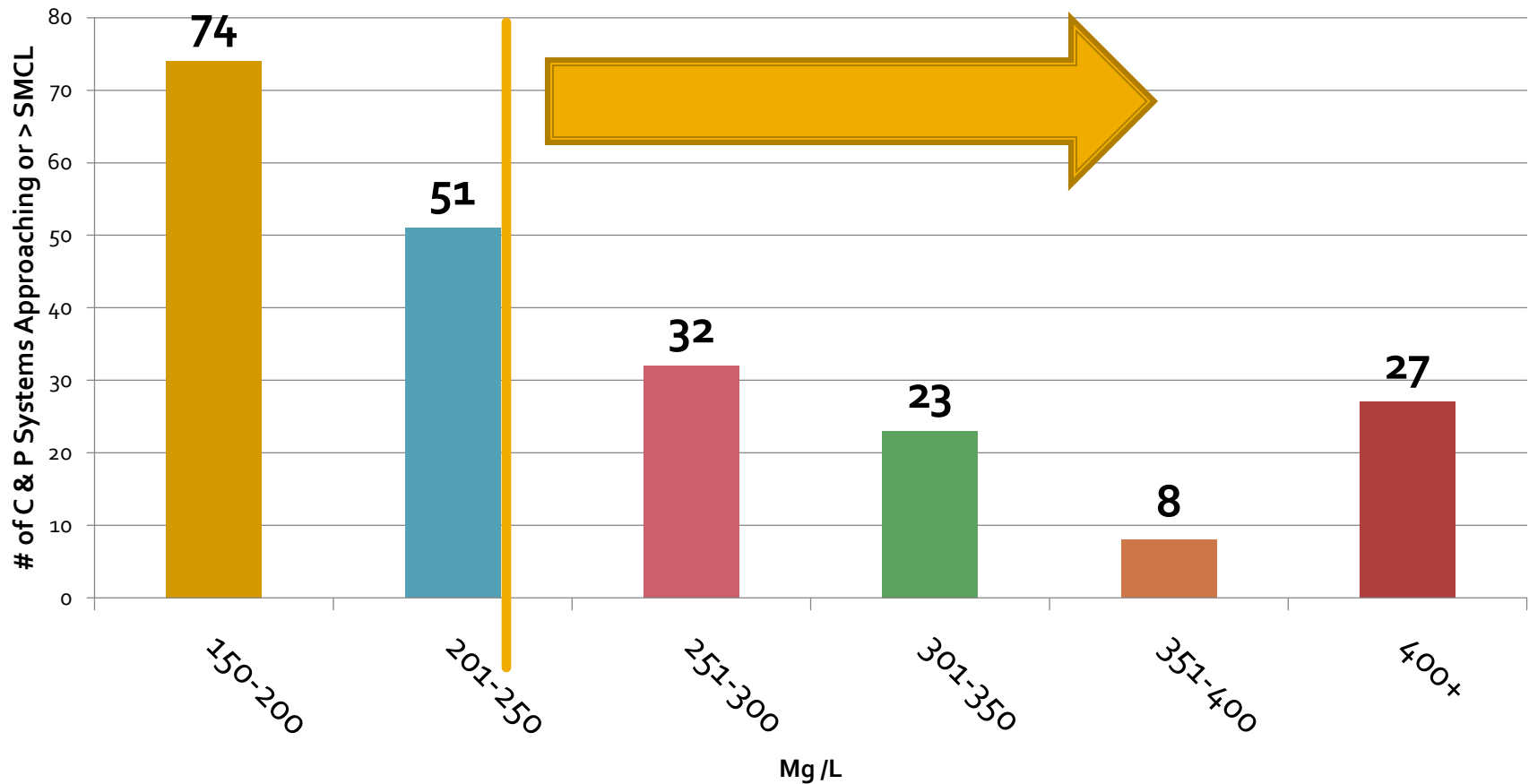
< 10% of WHPA  
within 1,000 ft of  
well has urban  
land cover

# Road Salt Trends (1985–2005) Sodium & Chloride



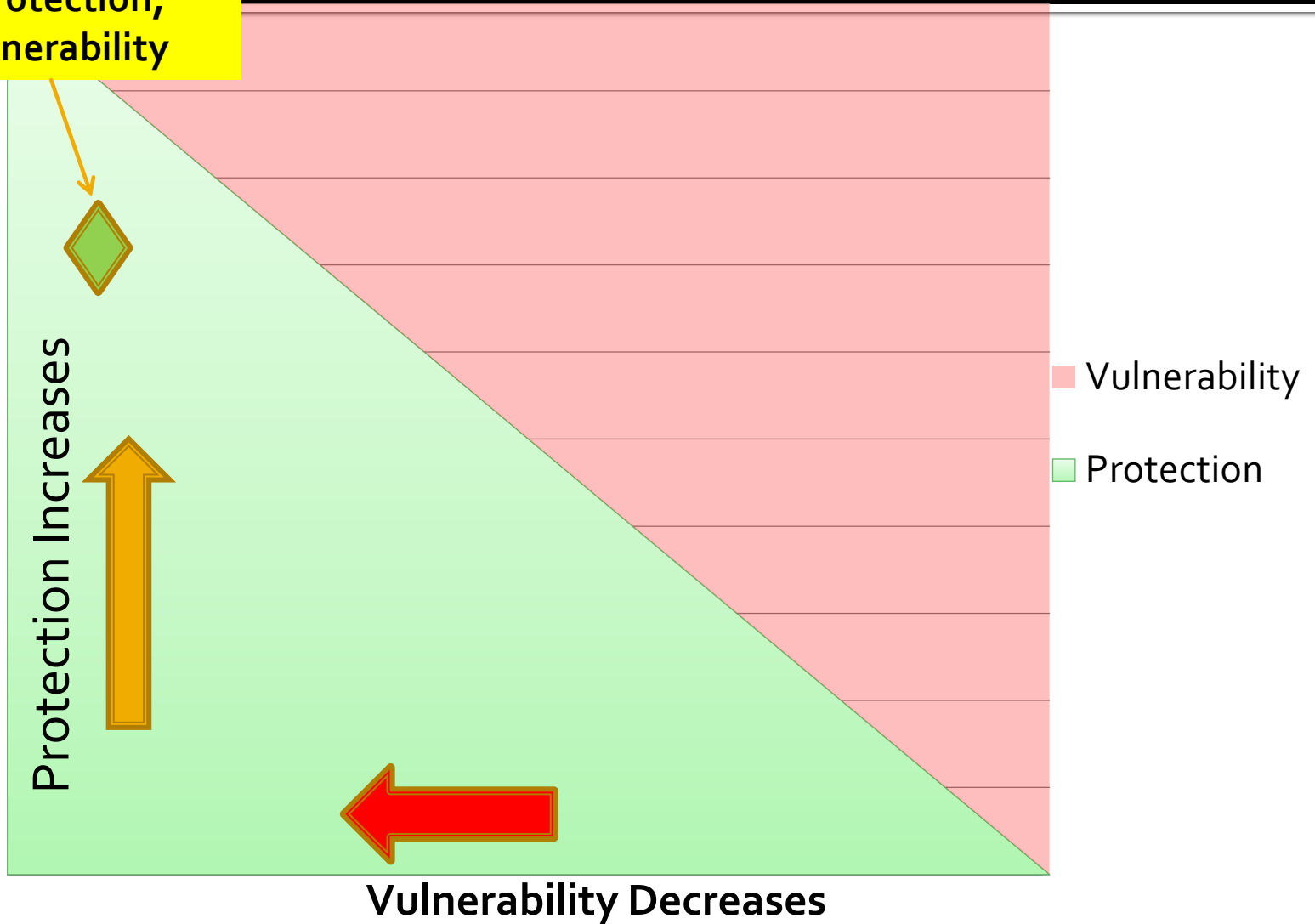
# Chloride in PWSs... Approaching and Above SMCL

N = 215 C and Ps Systems with Sources Approaching or Exceeding Chloride SMCL (250 mg/L)



# The Ideal.

High protection,  
low vulnerability



*Env-Dw 902.30 Protection of the Purity of the Bellamy Reservoir and Its Watershed.*

Waterbody	Location	Water System		
Bellamy Reservoir	Barrington, Dover, Madbury	Portsmouth Water Works		
Restrictions that Apply to this Waterbody	Also Within 75 ft of the Water's Edge	Within 100 ft of the Rte 9 Bridge	Within 2000 ft of the Water Supply Intake Structure	Associated Rule
No Motorboats	n/a	n/a	n/a	Env-Dw 902.30(G5)
No Swimming/Bathing/Allowing Animals To Enter	n/a	n/a	n/a	Env-Dw 902.30(G4)
No Sea Planes	n/a	n/a	n/a	Env-Dw 902.30(G9)
All Activities Prohibited	n/a	X	X	Env-Dw 902.30(G6,7)
No Structure To Keep Animals Or Fowl	X	n/a	n/a	Env-Dw 902.30(G1)
No Dead Animals/Fish	X	n/a	n/a	Env-Dw 902.30(G3)
No Food/Perishables/Decayable Material	X	n/a	n/a	Env-Dw 902.30(G3)
No Manure/Human Waste	X	n/a	n/a	Env-Dw 902.30(G3)
No Sewage Or Other Waste	n/a	n/a	n/a	Env-Dw 902.30(G2,8)

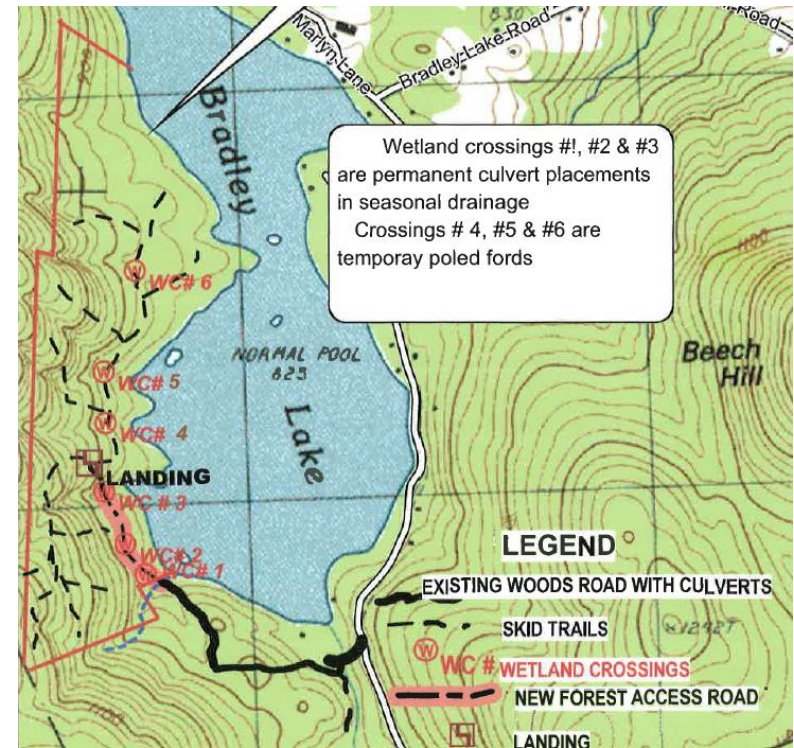
Source: <https://www.des.nh.gov/organization/commissioner/legal/rules/documents/env-dw902.pdf>

Key:   = Applies in The Water, On The Ice, And On The Shores Only

X = Applies within the parameters outlined in this column.

# But, No “Natural State” buffer Requirement for Surface Sources

- A 400 acre parcel is scheduled to be cleared and will remove natural cover
- Given the proximity and slope of the site, it could result in short and long-term degradation of water quality.
- Turbidity and color are treatment considerations



*A conversion of 1% of a watershed from forested to developed land is associated with an increase in turbidity by 3.9%.*  
(AWWA. Warziniack, US Forest Service, 2016)

# Surface Water & Impervious

Imperviousness (%)

80  
70  
60  
50  
40

Table 5. Protection metrics.

ECOLOGICAL METRICS	STRESSOR METRICS	SOCIAL METRICS
MAINTENANCE OF % NATURAL COVER STRAHLER STREAM ORDER $\leq 3$ WATERSHED %: NATURAL COVER FOREST WETLANDS NATURAL SERVICES NETWORK ACTIVE RIVER AREA %: NATURAL COVER FOREST WETLANDS	WATERSHED AQUATIC BARRIERS CORRIDOR ROAD CROSSING DENSITY WATERSHED %: IMPERVIOUS AREA DEVELOPED INCREASE IN DEVELOPED CLASSES ACTIVE RIVER AREA %: IMPERVIOUS AREA DEVELOPED	WATERSHED-BASED PLAN EXISTENCE JURISDICTIONAL COMPLEXITY # DRINKING WATER INTAKES WATERSHED %: PROTECTED LAND AGRICULTURE PASTURE

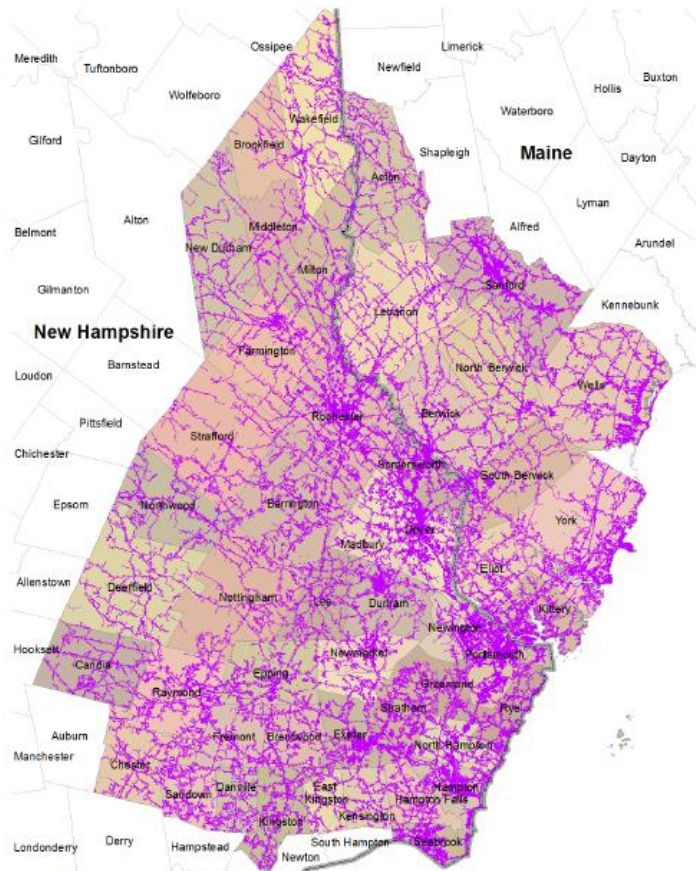
## NEW HAMPSHIRE NONPOINT SOURCE MANAGEMENT PROGRAM PLAN

SEPTEMBER 26, 2014

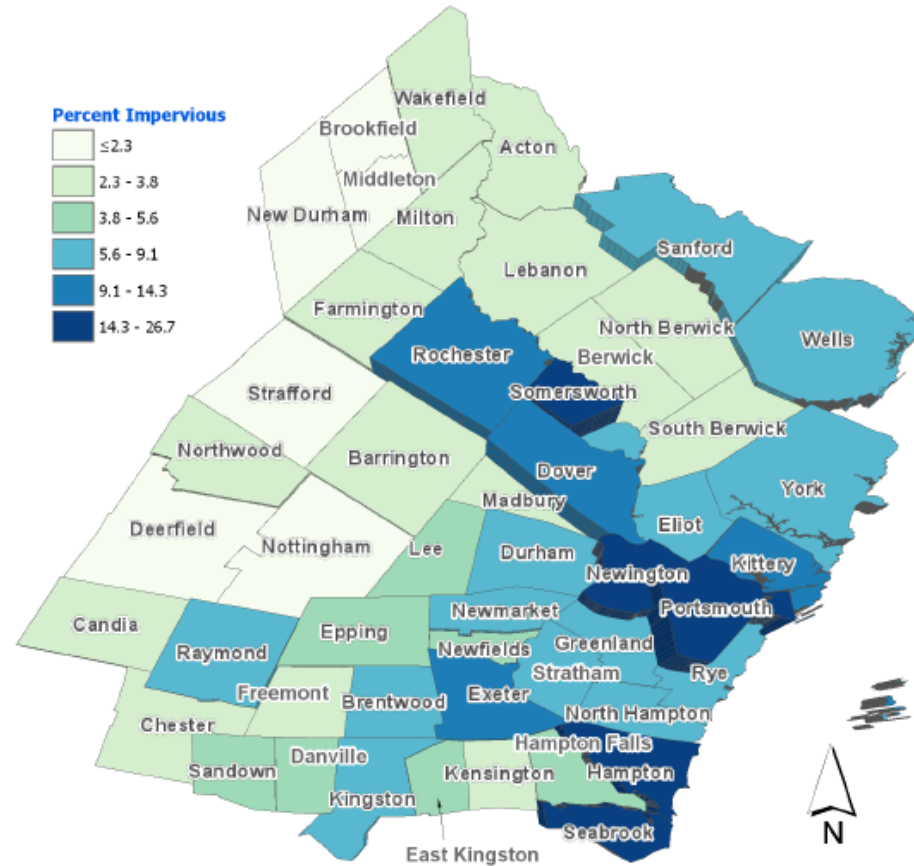


# Land Use Change....

Figure 4. Distribution of 2015 impervious cover in the project study area. Impervious features displayed in purple.



**Figure 6. Percent impervious cover by town, 2015.**



## Monitoring land use change (trends) near sources, within Source Protection Areas....?

# New (large) Community Source Approvals – NHDES Env-Dw 302

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- Well location/setback requirements
- Environmental impacts
- Source water protection
  - Sanitary protective radius control
  - Groundwater BMP inspections in the WHPA
  - Public Education
- Water quality monitoring
- Water use efficiency

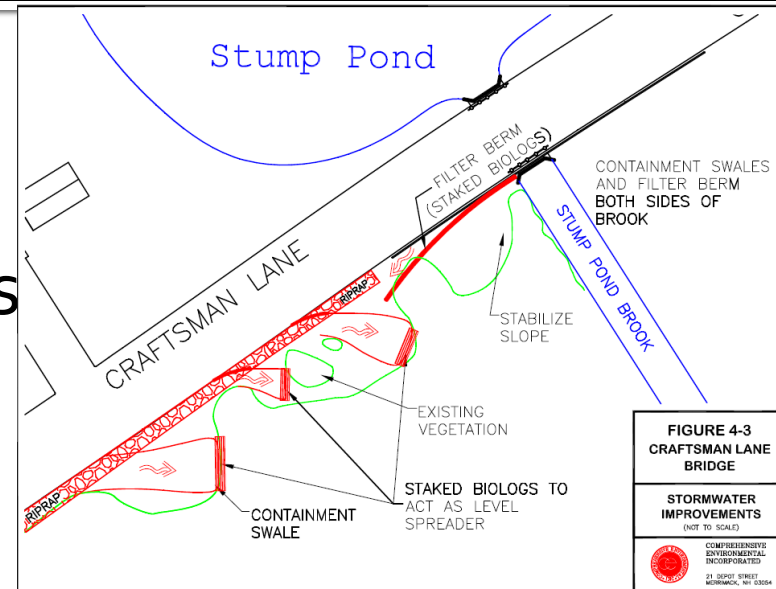
# Chemical Monitoring Waivers

*Env-Ws 321.08*

- Started in 1993
- Allows reduced sampling for VOC/SOCs in exchange for implementing source protection
- C & P systems are eligible
  - Systems must be in compliance
- Reduce VOC & SOC sampling to 3 or 6 years
  - 6 year SOC waiver saves \$2,250
- 76% of eligible systems have waivers

# Protection Via Local Source Water Protection Grants

- Started in 1997
- Drinking Water SRF Set-Asides
- ~\$200,000 annually
- Protect Existing DW Sources
  - Delineation, Assessment, Planning, Implementation
  - Source Security



Grant Website

[https://www.des.nh.gov/organization/divisions/water/dwgb/dwssp/lswp\\_grants.htm](https://www.des.nh.gov/organization/divisions/water/dwgb/dwssp/lswp_grants.htm)

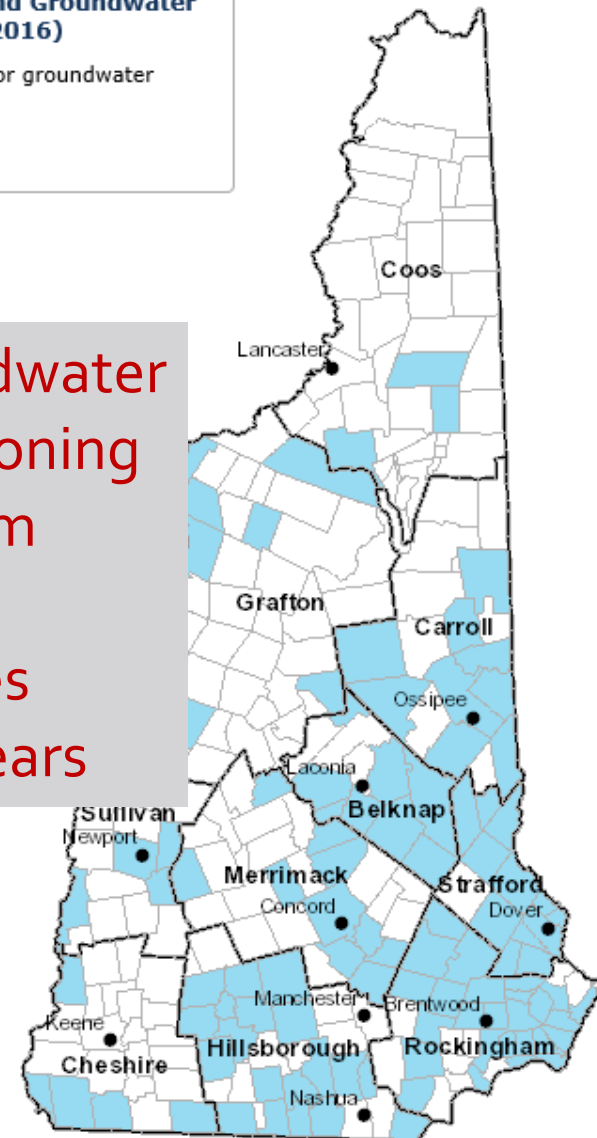
# Technical Assistance

- ✓ Public a model GW Zoning Ordinance and fund planning process to adopt local codes
- ✓ Conduct 3 RPC land use planner workshops and annual conference
- ✓ Support 2 SWP “Collaboratives” – Salmon Falls and Saco watersheds

**Municipalities with Aquifer and Groundwater Protection Zoning Districts (2016)**

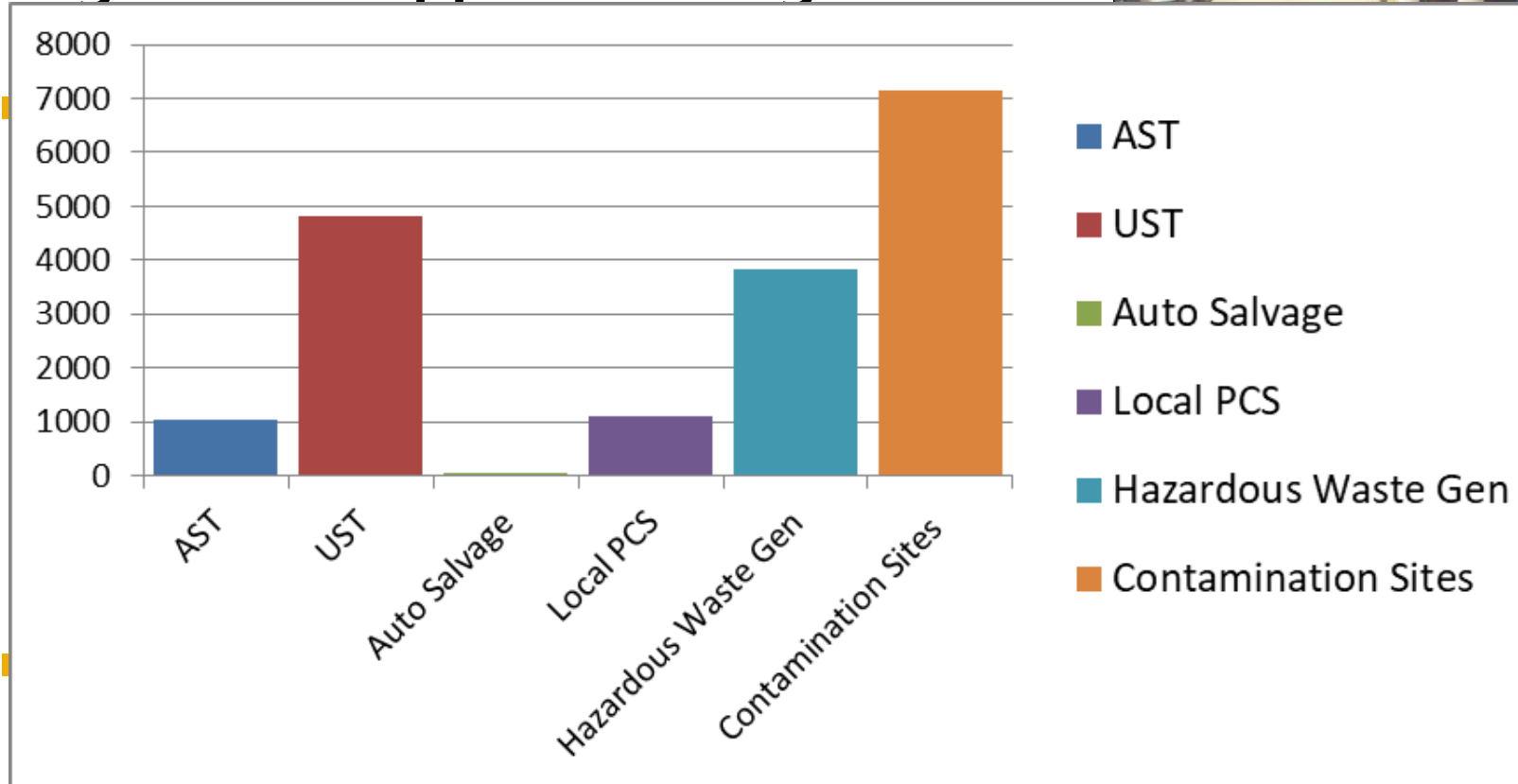
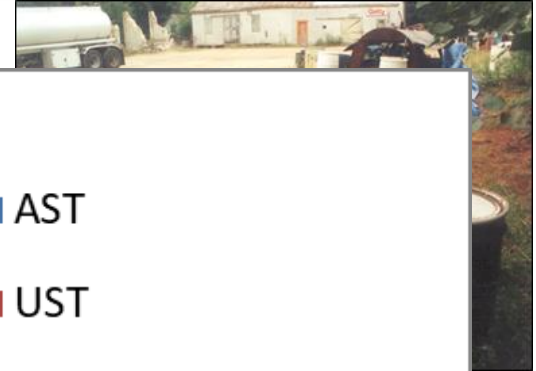
■ Municipality with aquifer and/or groundwater protection districts  
— County boundaries  
— Town boundaries

Local Groundwater Protection Zoning has risen from ~ 70 to 104 municipalities over last 9 years



# Promote and Enforce Groundwater Best Management Practices, RSA 485-C

Regulations applies to “regulated



18,009 “sites” within 14% of the state  
(overlying stratified drift areas)

# State "Reclassification" Under The N.H. Groundwater Protection Act

**GAA**

(WHPAs): Limits six higher risk land uses, requires local BMP program

**GA1**

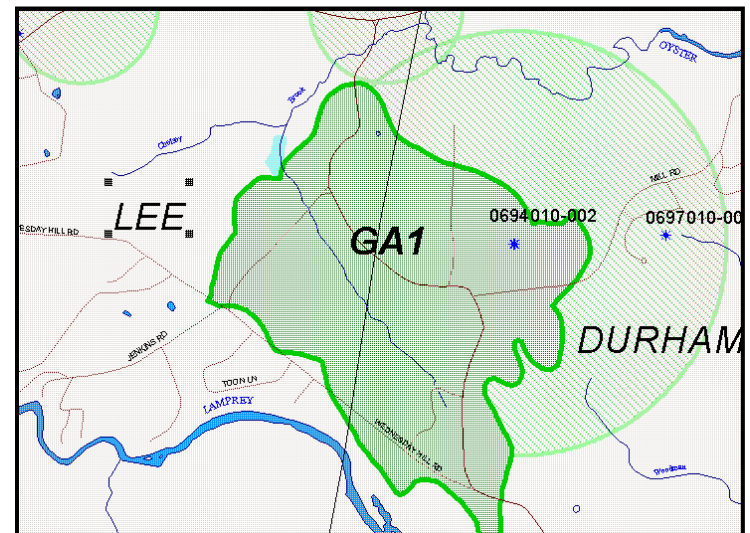
High Value Groundwater Local BMP management (no use restrictions)

**GA2**

No Active Management

**GB**

No Active Management



# Groundwater Recharge Program

- *Groundwater Permitting* (104)
- **Nondomestic Wastewater Registration** (2,241)
  - Underground Injection Control Program
  - Nondomestic Wastewater
  - Water Treatment wastewater
- **Temporary Discharge Permitting** (50-70/yr)

# Groundwater Discharge Permitting at NHDES

- **Rapid Infiltration** (15)
- **Unlined Wastewater Lagoons** (38)
- **Slow Rate Spray irrigation** (9)
- **Overland Flow and Drip Irrigation** (4)
- **Septage/Sludge Facilities** (9)
- **Large Septic Systems** (23)
- **Overland Flow Systems** (2)

# Water Conservation Rules

## Env-Wq 2100

- Water Conservation Rules (Env-Wq 2101) apply to “all new water withdrawals
  - New GW sources for bottled and bulk water operations subject to RSA 485:3;
  - New GW sources that exceed 57,600 gallons over any 24-hour period subject to RSA 485-C; and
  - New sources of surface water associated with projects that require a water quality certification pursuant to Section 401 of the Federal Clean Water Act.
- Leak detection, metering, conservation education

# Water Conservation Program

- Water Conservation Rules (Env-Wq 2101)
  - Env-Wq 2101.02 lists types of water users subject to rules
    - Develop and implement water conservation plans
- Offer grants and technical assistance
  - Leak Detection Survey Grant
    - Free survey for any community water system in NH
- Partner with EPA's WaterSense Program
  - Promote water efficiency efforts and products



# Public Education

## SWP Annual Conference



Over 2,000 attendees over the last decade.

# NH Drinking Water Week Festival

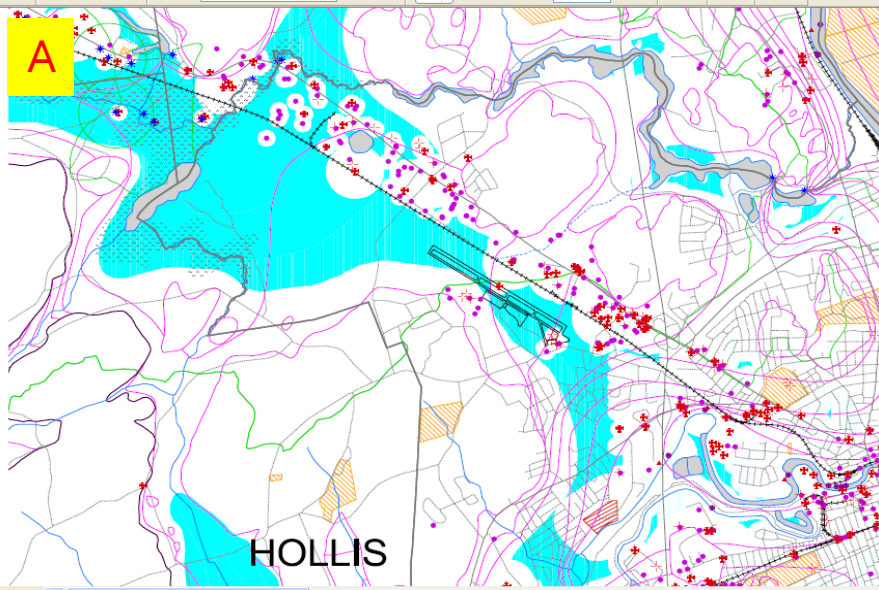
- 15<sup>th</sup> year; NH Drinking Water Week Coalition
- Held annually at various locations - 4<sup>th</sup> (and sometimes 5<sup>th</sup>) graders and their teachers
- State 4<sup>th</sup> grade water science fair finals
- Exhibitors from local, state, and federal
- Project WET activities



# Work with Partners (many)

- NHDOT
- NH DAMF
- RPCs/UNH PREP
- Municipalities
- Permit recommendations GW BMPs
- Review special permits (pesticide application)
- Planning and implementation of local protections

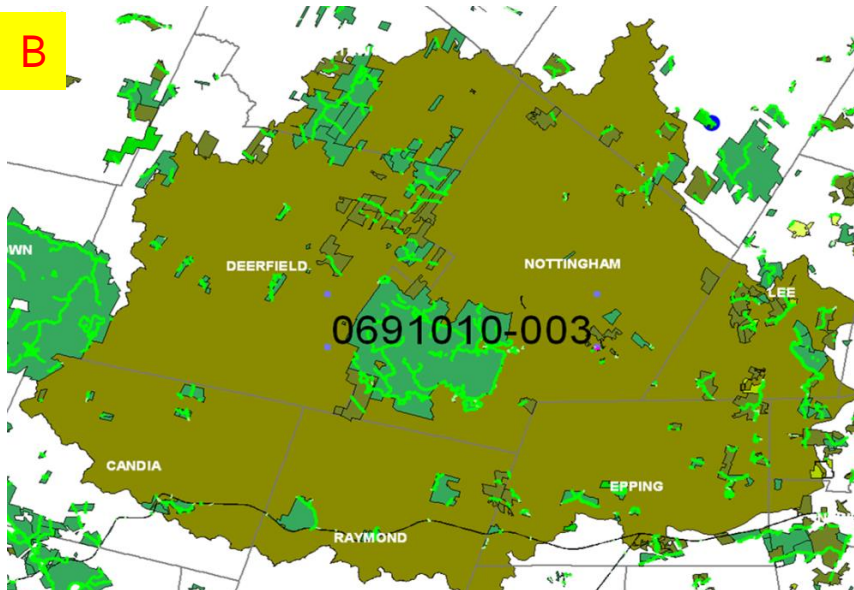
# Geographic Information System Maps to Support Protection



A. Favorable gravel well areas that may support large community wells

B. Buffer “gap” mapping to identify where no protection exists for surface sources or tributaries

C. Standard “drinking water” resource maps



# Break (15 minutes)!



# Protections, Gaps, Opportunities

## Note Your Thoughts on the Handout

Advisory Committee: Drinking Water Source Protection Strategy

Protection, Gaps and Opportunities Feedback Form

Date: 11/27/18

**Topic: Cyanobacteria Harmful Algal Blooms (HABs)**

Surface Source Water Quality Protection	Advisory Committee Feedback:
<b>Protection(s):</b> Cyanobacteria monitoring, watershed planning, and PWS response protocols to address Harmful Algal Blooms (HABs) and limit exposure to cyanobacteria toxins.	How important is the gap, threat and/or opportunity? Other suggestions?
<b>Gap:</b> Few public water systems using lakes/ponds/reservoirs as water supply sources are regularly monitoring for conditions or indicators of HABs (cell counts, pigments, toxins, etc.)	High___ Medium___ Low___
<b>Gap:</b> Water systems using surface sources may not have protocols concerning how to response to a HAB event (e.g., notification protocols, HAB sampling protocols, treatment optimization, etc.) within their emergency response plans.	High___ Medium___ Low___
<b>Threat(s):</b>  1. Lack of periodic surveillance/testing for cyanobacteria capable of	High Medium Low

# Part III: Discussion Exercise

## Feedback (60 minutes)

1. Cyanobacteria or Harmful Algal Blooms
2. Emergency Response
3. Best Management Practices for GW Protection

- 3 “Gaps and Opportunity” Sheets
- Take a few minutes to read the sheet
- Indicate what you feel is a more or less important

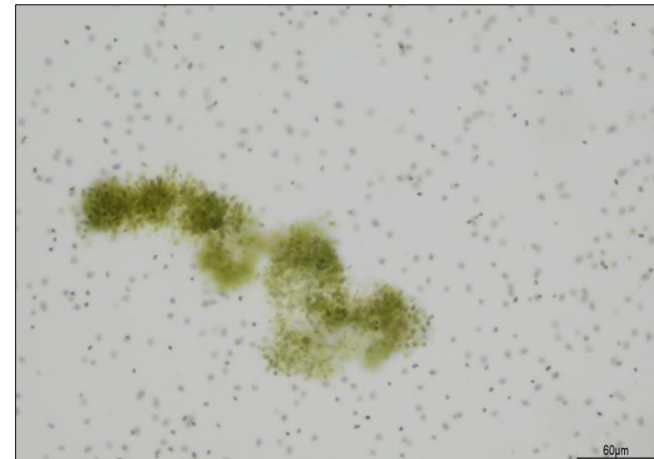
# Cyanobacteria Blooms in NH PWS (2018)

- Weirs Channel – Laconia, NH
  - Drains to Paugus Bay (drinking water source for Laconia Water Works)
  - Lake Warning for cyanobacteria in effect from 6/29/18 → 8/9/18
  - *Anabaena/Dolichospermum*, *Microcystis*, *Woronichinia*
    - >1 million cells/mL at highest concentration



Weirs Channel –  
Laconia, NH (June  
2018)

Microscopic  
image of  
*Microcystis*  
colonies  
identified in a  
sample  
collected  
from Weirs  
Channel on  
6/29/18

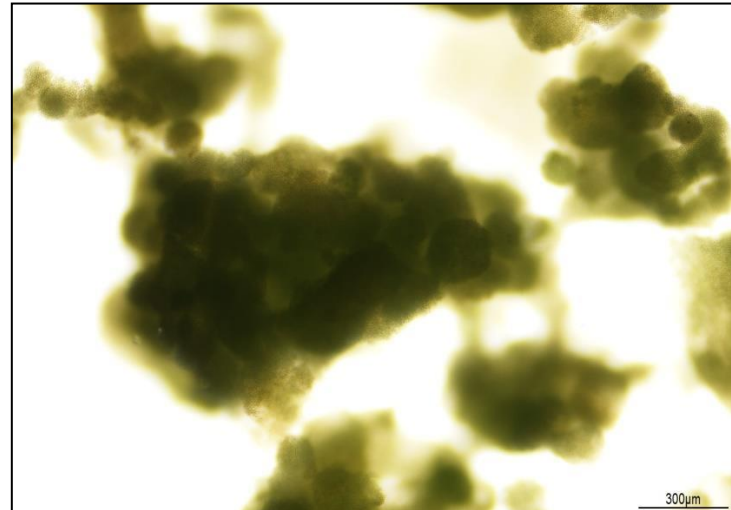


# Cyano Blooms in NH PWS (2018)

- Arlington Mill Reservoir – Salem, NH
  - Seasonal drinking water source for Salem Water Dept. (not in use during bloom)
  - Lake Warning for cyanobacteria in effect from 8/17/18 → 10/22/18
  - *Microcystis* and *Woronichinia*
    - Occurred as blue-green “globs” around shoreline
    - >1 million cells/mL at highest concentration
  - Previous bloom in 2017



Arlington Mill Reservoir – Salem, NH (August 2018)



*Microcystis* colonies identified in a sample collected from Arlington Mill Reservoir on 8/16/18

# Cyano Blooms in NH PWS (2018)

- Massabesic Lake  
Manchester/Auburn, NH
  - Drinking water source for Manchester Water Works
  - Blooms of *Anabaena/Dolichospermum* in June 2017 and June 2018
  - Historical blooms in tributary ponds (Clark Pond, Tower Hill Pond)



Tower Hill Pond – Candia/Auburn, NH  
(September 2014)

# Discussion Exercise #1

## Harmful Algal Blooms (“what if” scenario)

- A cyanobacterial “harmful algal bloom” (cyanoHAB) occurs near the intake of Sunapee Water Works on Lake Sunapee.
- The cause is believed to be inadequate erosion control at a large construction site on Sunapee Harbor that has exacerbated nutrient loading, coupled with inadequate erosion control and over-use of lawn fertilizer along the lake’s shoreline.
- The aging water treatment system for the area has not received necessary upgrades to remove this particular set of toxins, and is unable to treat the water effectively for use by the public.
- The Public Water system does not have a different (backup) source/s.

# Emergency Response

Elk River is a good example of how things can go terribly wrong.



Elk River, Charleston, WV

# Chemical Management Failures

- Poor Inventory of on-site chemicals
- Failure to address long-standing storage deficiencies
- Failure to communicate the spill to PWS quickly



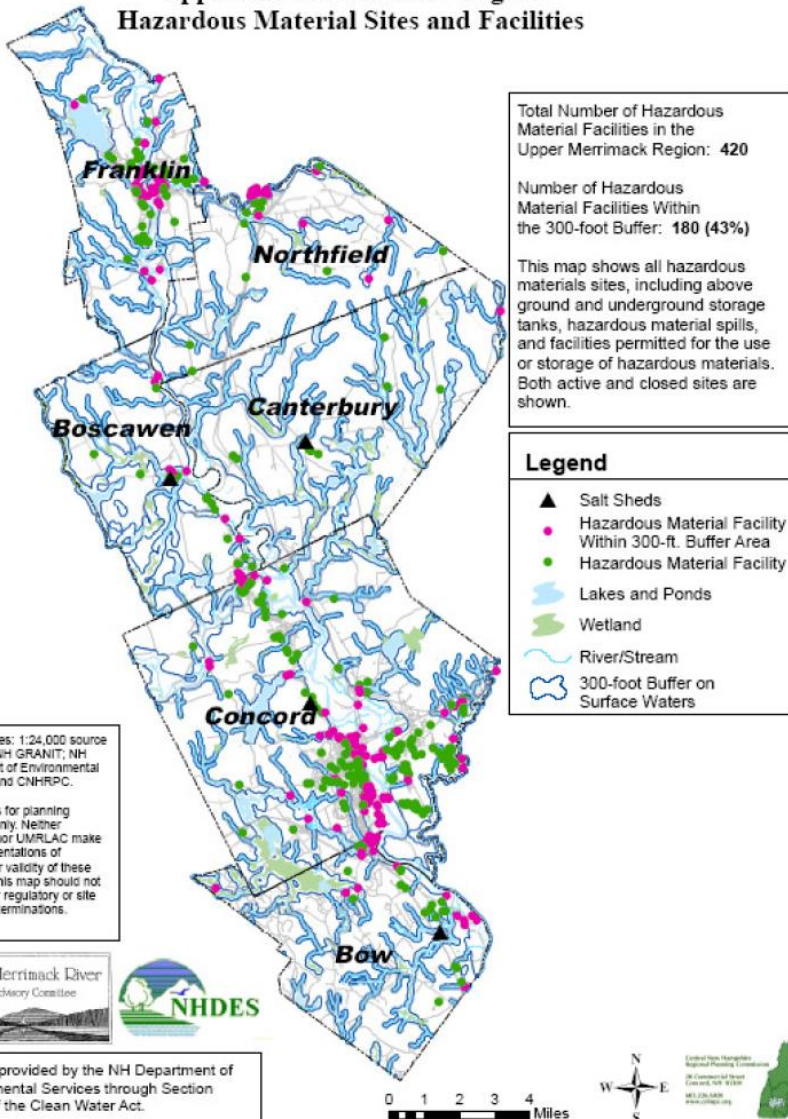
# Upper Merrimack River Buffer Study

present an urgent threat to the river and watershed...

- UPPER MERRIMACK RIVER BUFFER PROTECTION STUDY (2010)  
<http://merrimackriver.org/publications/umrlacbuffer7.19.10.pdf>

*“With a significant number of hazardous material sites already located close to surface waters, there is a clear need to ensure that local regulations are in place that limit future development of such sites, (Upper Merrimack River Corridor Management Plan, 2008, pg. 6)*

## Upper Merrimack River Region Hazardous Material Sites and Facilities



Map 3. Hazardous Materials Sites and Facilities

# Spill Risks?

- 1,522 spills in the towns represented by Southern NH Planning Commission and Nashua Regional Planning Commission within the past 10 years (NHDES, B. Bishop, verbal)



March 2016

# Discussion Exercise #2:

## Emergency Response

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- A large spill of an unknown substance occurs into a major surface source.
- The cause is believed to be from a leaking chemical tank leaking into a stormwater drainage pipe into the Salmon Falls River.
- The concentration/chemical/health properties when reaching the plant are unknown, and the PWS(s) was not contacted when release discovered.
- What about Maine and Massachusetts PWSs?

# Discussion Exercise #3

## Best Management Practices for Groundwater Protection



# BMP Inspections Ensure Compliance With Best Management Practices

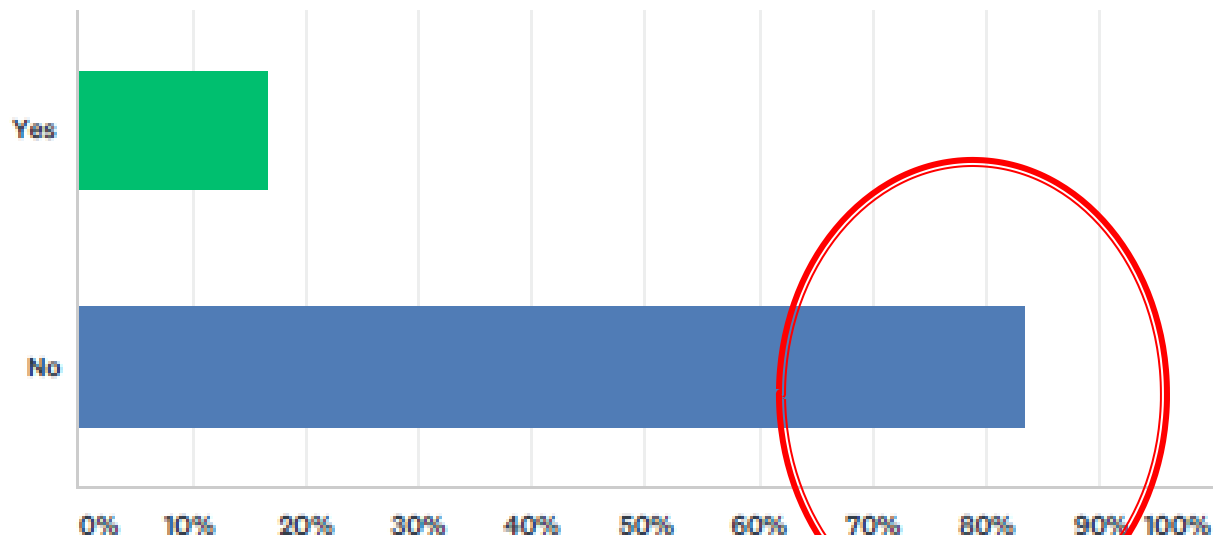
- ✓ Groundwater Protection Act requires BMPs
- ✓ Large majority of PCSs are not inspected in Source Protection Areas
- ✓ Water systems and towns administer local programs



# Local Inspector Survey (2018)

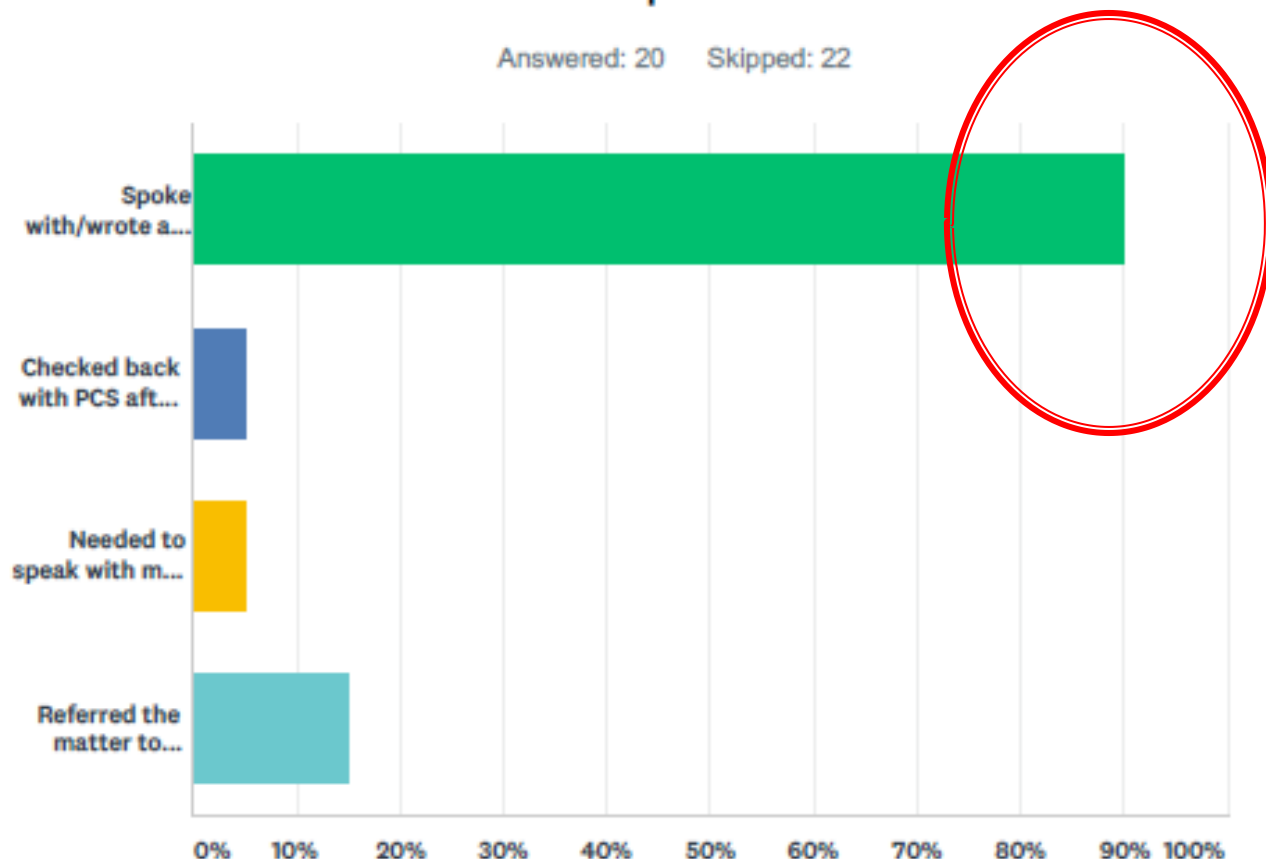
Q1 Have you found serious Env-Wq 401 violations during BMP inspections? (e.g., regulated containers not stored atop an impervious surface, no secondary containment on outside regulated containers, active leak of a regulated substance, etc.)

Answered: 42 Skipped: 0



# Local Inspector Survey (2018)

Q3 In your experience, when a serious compliance issue has arisen out of a BMP inspection (like those noted in the previous question) what did you need to do to resolve the compliance issue? Check all that apply.



# Discussion Exercise #3:

## Best Management Practices

- A Local inspector discovers a 1,500 chemical tank associated with a local business.
- The tank is rusted, on-dirt, and there is clearly evidence of spills where the chemical is transferred. Multiple violations, a high risk.
- The municipal wells are 750 feet from the site and groundwater from this area is recharging the municipal wells.
- The inspector sends a letter but since the inspector does not follow up. Two years later, detects are found in the municipal sources possibly from the site.

# Contaminants With and Without Safety Standards

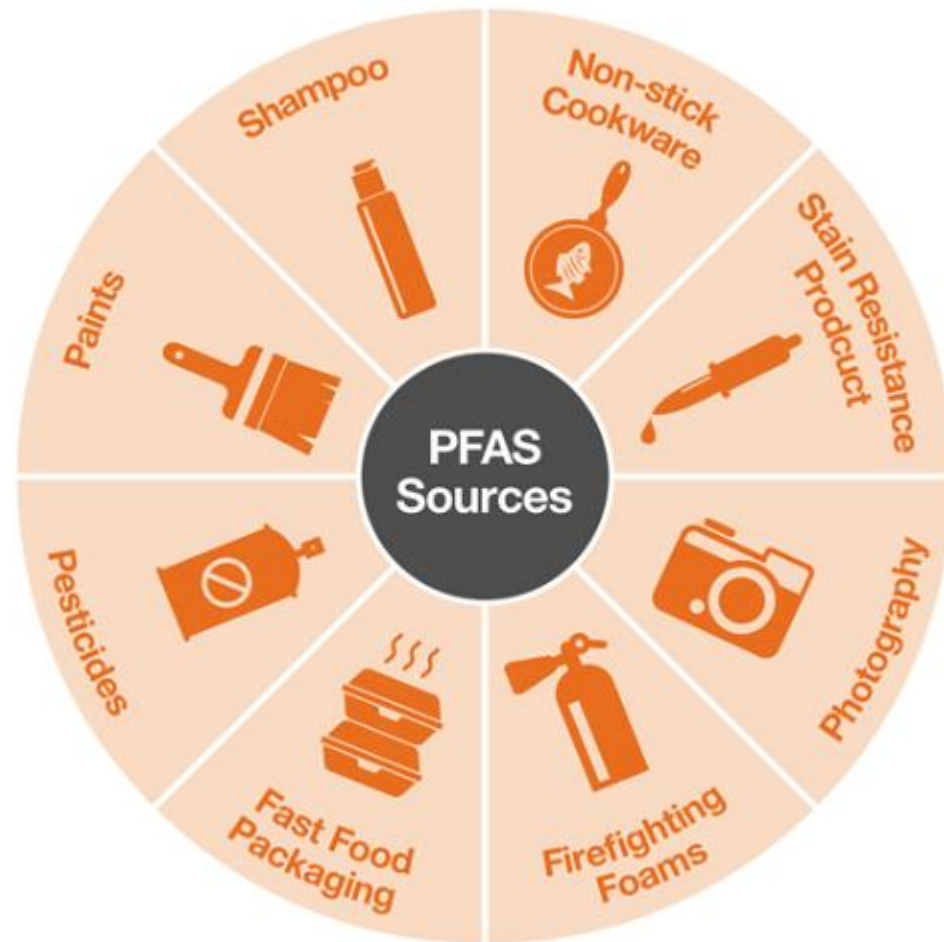
Figure 1. 316 contaminants found in nation's tap water, more than half have no safety standards.



Source: Environmental Working Group analysis of PWS test data for 2004-2009 for 47,677 communities in 45 states and DC.

# Emerging Contaminant: Per- and polyfluoroalkyl substances (PFAS)

- Per- and polyfluoroalkyl substances (**PFAS**) are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many other chemicals. ...
- EPA established lifetime health advisories of 70 ppt for PFOA and PFOS
- Exposure to PFAS can occur through drinking water contamination, food packaging containing PFAS, storm water runoff, and PFAS-containing wastes, such as the gases emitted from landfills.



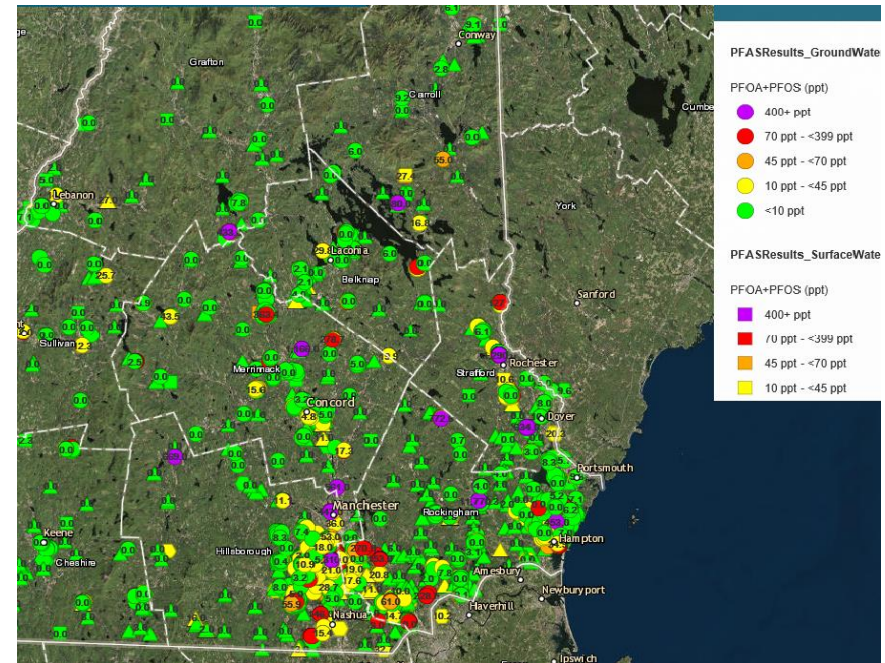
Source: Australian Department of Defence

# A few “knowns”

- Recent studies estimate as many as 3,000 PFAS compounds are now or have been on the global market (Wang et al. 2017).
- It's in many products that may be discharged through septic systems or air emissions.
- At least 30 types of industry use PFAS compounds and found in historic waste sites.
- It's present in municipal firefighting foam (Class B)
- Routes of exposure to PFASs include diet ([Fromme et al. 2007](#)), dust ([Shoeib et al. 2005](#)), and drinking water ([Hu et al. 2016](#)).

# A few ideas on Limiting PFAS in Drinking Water Resources

- Identify municipal inventories of Class B fire fighting foam and require or encourage exchange programs.
- Develop better information concerning PFAS use and possible discharge via commercial entities.
- Develop priority list of home or commercial products known to contain high levels of PFAS
- Advise municipalities to limit certain land uses involving PFAS from areas near drinking water resources.

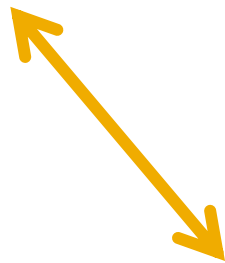


# Working Groups

## Working Groups

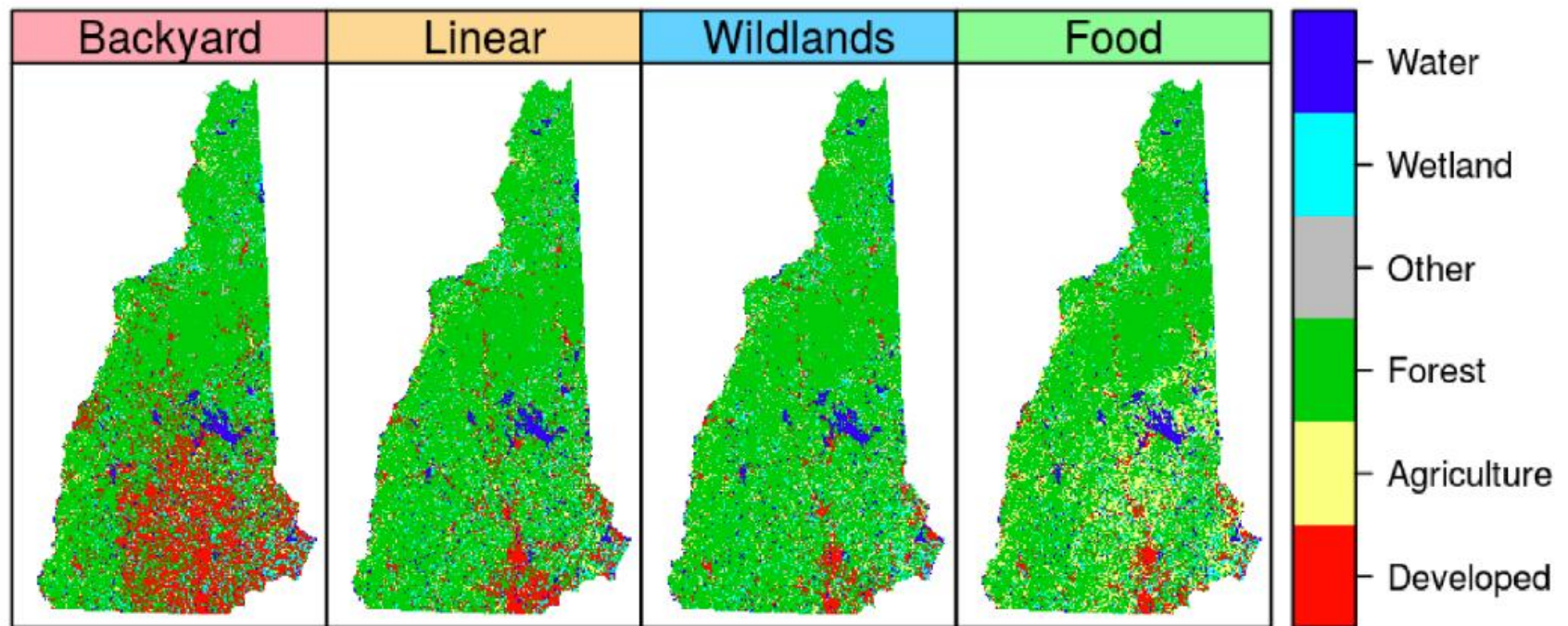
Surface Water Protection

Groundwater Protection



1. Emerging Contaminants
2. Land use management & Trends
3. Climate Mitigation
4. Model Municipal Code Development
5. State Regulation Review
6. Enhancing Partnerships/Collaboration
7. Education, Outreach & Training

# Strategy to Address The Future



Climate?

# Next Steps

- Questions/Info Needed from Today
- NHDES can build a “matrix” of more detailed possible actions for discussion
- Establish working groups to help craft actions
- Feedback via On-line Tools (polls, etc.), thoughts?
- Next AdCom Meeting Date
  - Last week of January?
- Thank you!